



OPERATOR'S MANUAL

INCLUDING: OPERATION, INSTALLATION & MAINTENANCE

50 SERIES DRILLS

SECTION M20
MANUAL 11
Released: 11-3-86
Revised: 10-6-95
Form: 2940-2

Models: DG051B-()-(), DG052B-()-(),
DL051B-()-() and DL052B-().



⚠ WARNING

**READ THIS MANUAL CAREFULLY BEFORE INSTALLING,
OPERATING OR SERVICING THIS EQUIPMENT.**

FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.

Pneumatic tools should always be installed and used in accordance with A.N.S.I. B186.1 "Safety Code For Portable Air Tools."

⚠ WARNING

- Operate this tool at 90 p.s.i.g. (6.2 bar) maximum air pressure at the air inlet of the tool.
- Disconnect air supply from tool before removing/installing bit, socket or device attached to tool or performing maintenance procedures.
- Keep hands, clothing and long hair away from rotating end of tool.
- Anticipate and be alert for sudden changes in motion during start up and operation of any power tool.
- Never exceed rated r.p.m. of tool.
- Wear suitable eye and hearing protection while operating tool.
- Tool shaft can continue to rotate briefly after throttle is released.
- Do not lubricate tools with flammable or volatile liquids such as kerosene, diesel or jet fuel.
- Do not remove any labels. Replace any damaged label.
- Use only accessories recommended by ARO.

⚠ WARNING

Repeated prolonged operator exposure to vibrations which may be generated in the use of certain hand-held tools may produce Raynaud's phenomenon, commonly referred to as Whitefinger disease. The phenomenon produces numbness and burning sensations in the hand and may cause circulation and nerve damage as well as tissue necrosis. Repetitive users of hand-held tools who experience vibrations should closely monitor duration of use and their physical condition.

NOTICE

- The use of other than genuine ARO replacement parts may result in safety hazards, decreased tool performance and increased maintenance and may invalidate all warranties.
- ARO is not responsible for customer modification of tools for applications on which ARO was not consulted.
- Tool maintenance and repair should be performed by authorized, trained, competent personnel. Consult your nearest ARO authorized servicenter.
- It is the responsibility of the employer to place the information in this manual into the hands of the operator.

For parts and service information, contact your local ARO distributor, or the Customer Service Dept. of the Ingersoll-Rand Distribution Center, White House, TN at PH: (615) 672-0321, FAX: (615) 672-0801.

ARO Tool Products

Ingersoll-Rand Company

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FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.

⚠ WARNING



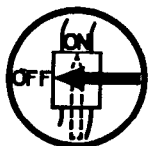
Wear eye protection when operating or performing maintenance on this tool.

⚠ WARNING



Wear hearing protection when operating this tool.

⚠ WARNING



Turn off air supply and disconnect air supply hose before installing, removing or adjusting any accessory on this tool, or before performing any maintenance on this tool.

⚠ WARNING



Air powered tools can vibrate in use. Vibration, repetitive motions or uncomfortable positions may be harmful to your hands and arms. Stop using any tool if discomfort, tingling feeling or pain occurs. Seek medical advice before resuming use.

⚠ WARNING



Do not carry the tool by the hose.

⚠ WARNING



Do not use damaged, frayed or deteriorated air hoses and fittings.

⚠ WARNING



Do not overreach when operating this tool. Keep body stance balanced and firm.

⚠ WARNING



Operate at 90 p.s.i.g. (6.2 bar/620 kPa) maximum air pressure.

NOTICE

⚠ WARNING

Read the manual before operating this tool.
Operate at 90 psig/6.2 bar max.



PN 48176-1 LABEL
(NON-EU MODELS)

PN 49883 LABEL
(-EU MODELS)

This label must appear on the tool at all times. If it is lost or damaged, a replacement label is available at no cost.

WARNING = Hazards or unsafe practices which could result in severe personal injury, death or substantial property damage.

CAUTION = Hazards or unsafe practices which could result in minor personal injury or product or property damage.

NOTICE = Important installation, operation or maintenance information.

ROUTINE LUBRICATION REQUIREMENTS

Lack of or an excessive amount of lubrication will affect the performance and life of this tool. Use only recommended lubricants at below time intervals:

EVERY 8 HOURS OF TOOL OPERATION – Fill lubricator reservoir of recommended F.R.L. with spindle oil (29665). If an in line or air line lubricator is not used, apply several drops of spindle oil (29665) in air inlet.

EVERY 160 HOURS OF TOOL OPERATION – Lubricate gearing. Pack bearings, coat shafts and lubricate gears with NLGI #1 "EP" grease (33153). Gearing should contain approximately 3/64 oz. (1.3 g) of grease for single reduction and 1/16 oz. (1.8 g) for double reduction.

AIR SUPPLY REQUIREMENTS

For maximum operating efficiency, the following air supply specifications should be maintained to this air tool:

- AIR PRESSURE – 90 p.s.i.g. (6.2 bar)
- AIR FILTRATION – 50 micron
- LUBRICATED AIR SUPPLY
- HOSE SIZE – 5/16" (8 mm) I.D.

An ARO® model C28231-810 air line FILTER/REGULATOR/LUBRICATOR (F.R.L.) is recommended to maintain the above air supply specifications.

RECOMMENDED LUBRICANTS

After disassembly is complete, all parts, except sealed or shielded bearings, should be washed with solvent. To relubricate parts, or for routine lubrication, use the following recommended lubricants:



Where Used	ARO Part #	Description
Air Motor	29665	1 qt. Spindle Oil
"O" Rings & Lip Seals	36460	4 oz. Stringy Lubricant
Gears and Bearings	33153	5 lb. "EP" – NLGI #1 Grease

INSPECTION, MAINTENANCE AND INSTALLATION

Disconnect air supply from the tool or shut off air supply and exhaust (drain) line of compressed air before performing maintenance or service to the tool.

It is important that the tools be serviced and inspected at regular intervals for maintaining safe, trouble-free operation of the tool.

Be sure the tool is receiving adequate lubrication, as failure to lubricate can create hazardous operating conditions resulting from excessive wear.

Be sure that the air supply lines and connectors are of proper size to provide a sufficient quantity of air to the tool.

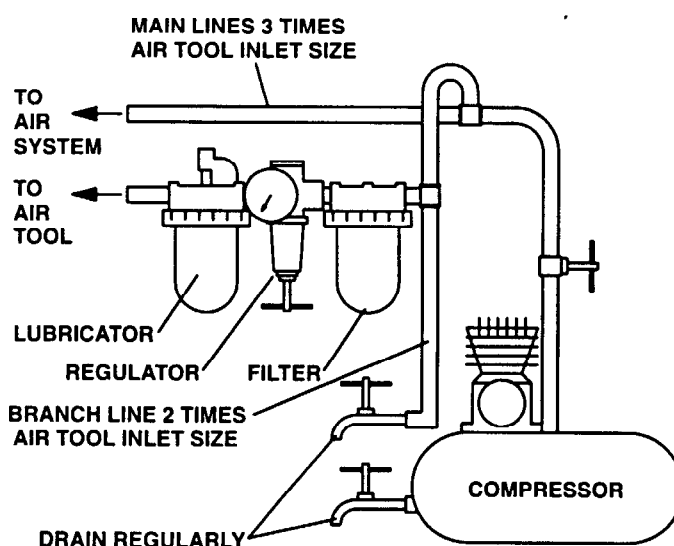
Tool maintenance and repair shall be performed by authorized, trained, competent personnel. Tools, hose and fittings shall be replaced if unsuitable for safe operation and responsibility should be assigned to be sure that all tools requiring guards or other safety devices shall be kept in legible condition. Maintenance and repair records should be maintained on all tools. Frequency of repair and the nature of the repairs can reveal unsafe application. Scheduled maintenance by competent authorized personnel should detect any mistreatment or abuse of the tool and worn parts. Corrective action should be taken before returning the tool for use.

Disassembly should be done on a clean work bench with a clean cloth spread to prevent the loss of small parts. After disassembly is completed, all parts should be thoroughly washed in a clean solvent, blown dry with air and inspected for wear levels, abuse and contamination. Double sealed or shielded bearings should never be placed in solvent unless a good method of re-lubricating the bearing is available. Open bearings may be washed but should not be allowed to spin while being blown dry.

Upon reassembling, lubricate parts where required. Use 33153 grease, or equivalent, in bearings. Use 36460 lubricant for "O" ring assembly. When assembling "O" rings or parts adjacent "O" rings, care must be exercised to prevent damage to the rubber sealing surfaces. A small amount of grease will usually hold steel balls and other small parts in place while assembling.

When replacement parts are necessary, consult drawing containing the part for identification.

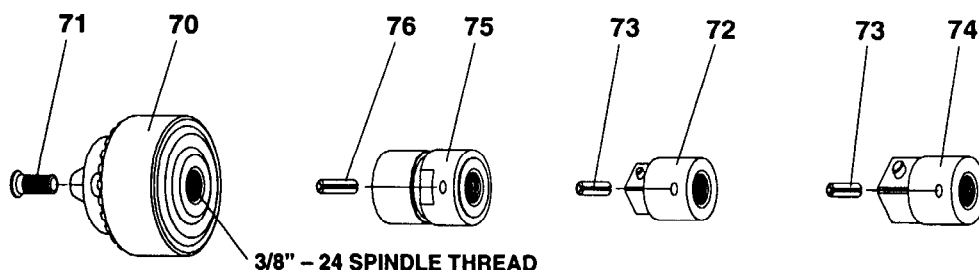
Always use clean, dry air. Dust, corrosive fumes and/or excessive moisture can damage the motor of an air tool. An air line filter can greatly increase the life of an air tool. The filter removes rust, scale, moisture and other debris from the air lines. Low air pressure (less than 90 p.s.i.g.) reduces the speed of the air tool. High air pressure (more than 90 p.s.i.g.) raises performance beyond the rated capacity of the tool and could cause injury. Shown below is a typical piping arrangement.

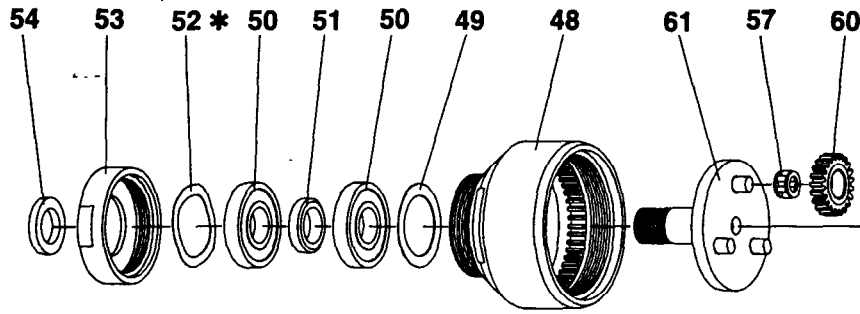


MODEL NUMBER	ROTATION	R.P.M.	ROTOR (ITEM 38)	MOTOR ASSEMBLY	GEARING RED.
DG051B-4-()-()	SINGLE	400	46470	48227-1	44.48:1
DG051B-6-()-()	SINGLE	600	46470	48227-1	29.35:1
DG051B-11-()-()	SINGLE	1100	46454	48226-1	15.09:1
DG051B-15-()-()	SINGLE	1500	46454	48226-1	11.76:1
DG051B-27-()-()	SINGLE	2700	46470	48227-1	6.67:1
DG051B-33-()-()	SINGLE	3300	46470	48227-1	5.33:1
DG051B-52-()-()	SINGLE	5200	46454	48226-1	3.43:1
DG051B-180-()-()	SINGLE	18,000	46470	48227-1	1:1
DG052B-4-()-()	REVERSIBLE	400	46470	47727	44.48:1
DG052B-6-()-()	REVERSIBLE	600	46470	47727	29.35:1
DG052B-10-()-()	REVERSIBLE	1000	46454	47728	15.09:1
DG052B-15-()-()	REVERSIBLE	1500	46454	47728	11.76:1
DG052B-25-()-()	REVERSIBLE	2500	46470	47727	6.67:1
DG052B-30-()-()	REVERSIBLE	3000	46470	47727	5.33:1
DG052B-50-()-()	REVERSIBLE	5000	46454	47728	3.43:1
DG052B-170-()-()	REVERSIBLE	17,000	46470	47727	1:1
DL051B-4-()-()	SINGLE	400	46470	48227-1	44.48:1
DL051B-6-()-()	SINGLE	600	46470	48227-1	29.35:1
DL051B-11-()-()	SINGLE	1100	46454	48226-1	15.09:1
DL051B-15-()-()	SINGLE	1500	46454	48226-1	11.76:1
DL051B-27-()-()	SINGLE	2700	46470	48227-1	6.67:1
DL051B-33-()-()	SINGLE	3300	46470	48227-1	5.33:1
DL051B-52-()-()	SINGLE	5200	46454	48226-1	3.43:1
DL051B-180-()-()	SINGLE	18,000	46470	48227-1	1:1
DL052B-4-()-()	REVERSIBLE	400	46470	47727	44.48:1
DL052B-6-()-()	REVERSIBLE	600	46470	47727	29.35:1
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DL052B-15-()-()	REVERSIBLE	1500	46454	47728	11.76:1
DL052B-25-()-()	REVERSIBLE	2500	46470	47727	6.67:1
DL052B-30-()-()	REVERSIBLE	3000	46470	47727	5.33:1

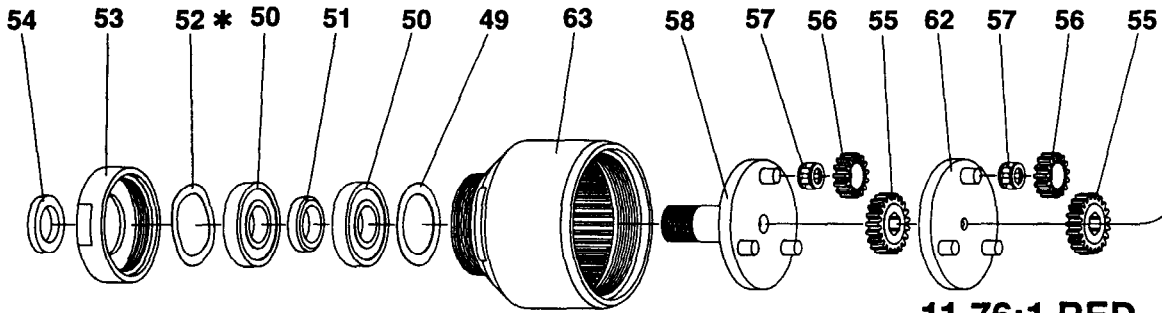
MODELS WITH -EU SUFFIX ARE "EC" COMPLIANT MODELS.

SPINDLE OPTION	DESCRIPTION (ITEM NO.)
-A	47340 CHUCK (70)
-B	47341 CHUCK (70)
-J	30384-5 ADAPTER (72)
-K	30384-9 ADAPTER (74)
-L	48459-1 CHUCK (70)
-P	NO OPTION
-Q	30712 ADAPTER (75)



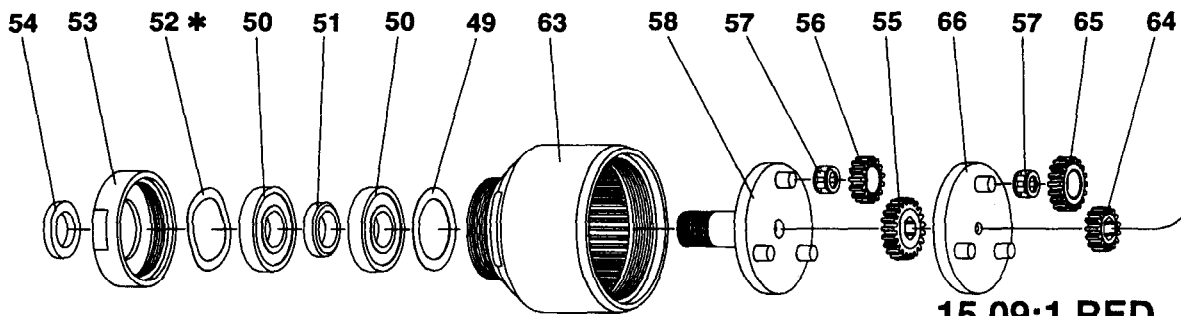


6.67:1 RED.

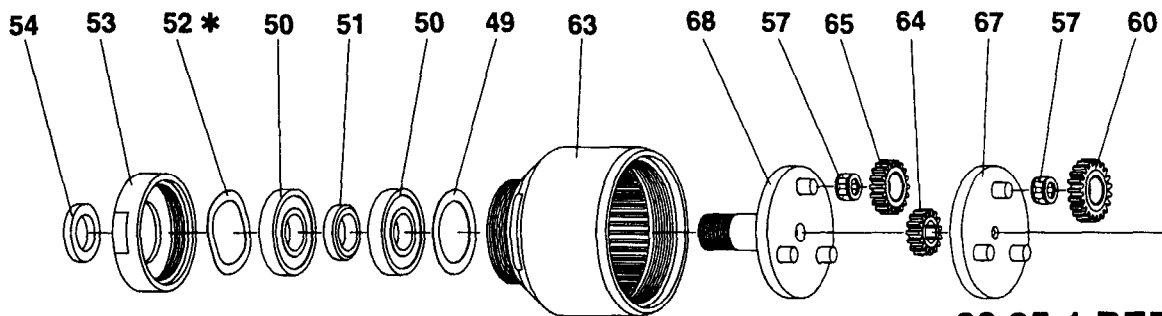


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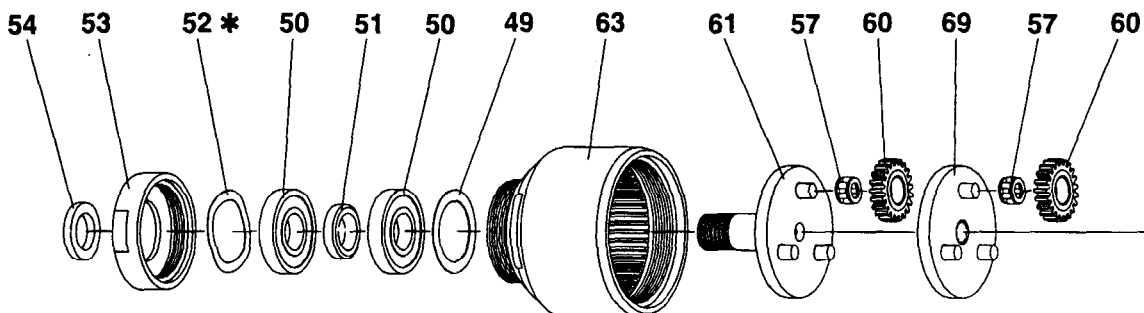
*** ITEMS INCLUDED IN SERVICE KIT NO. 47756-1**



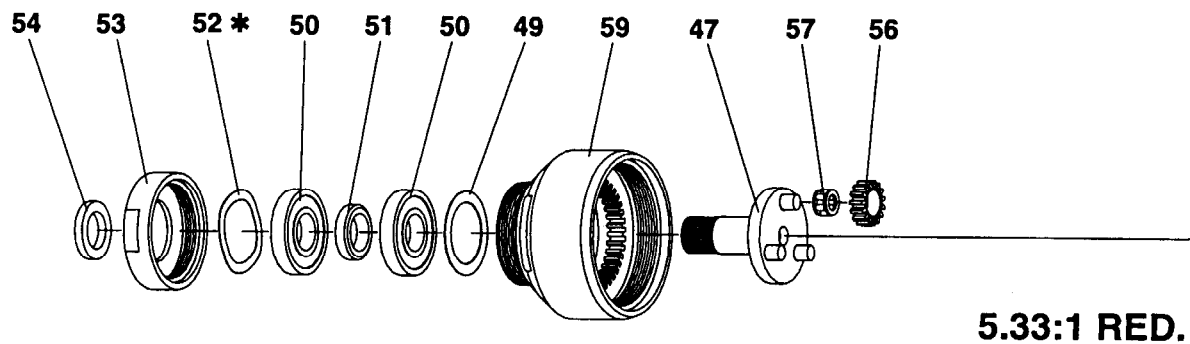
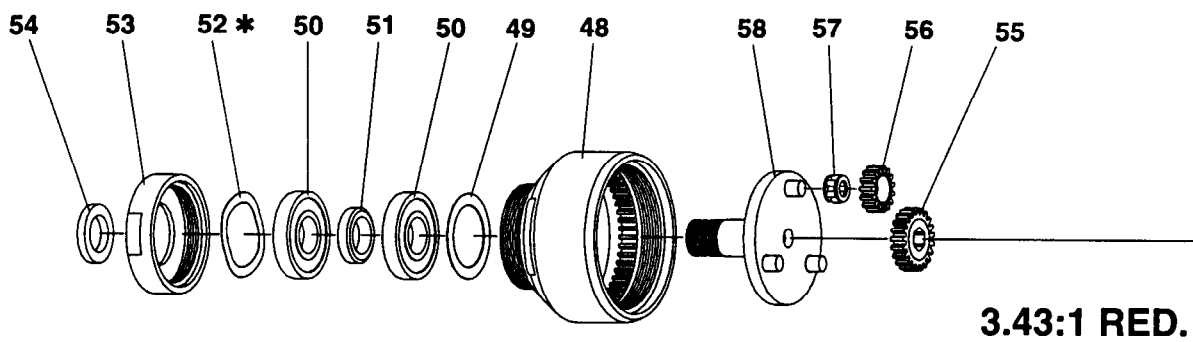
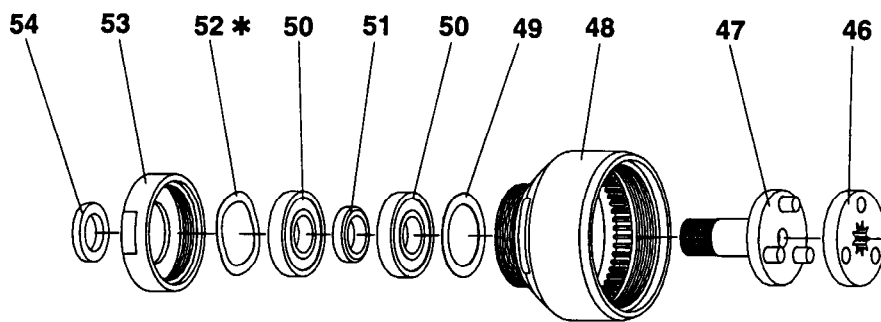
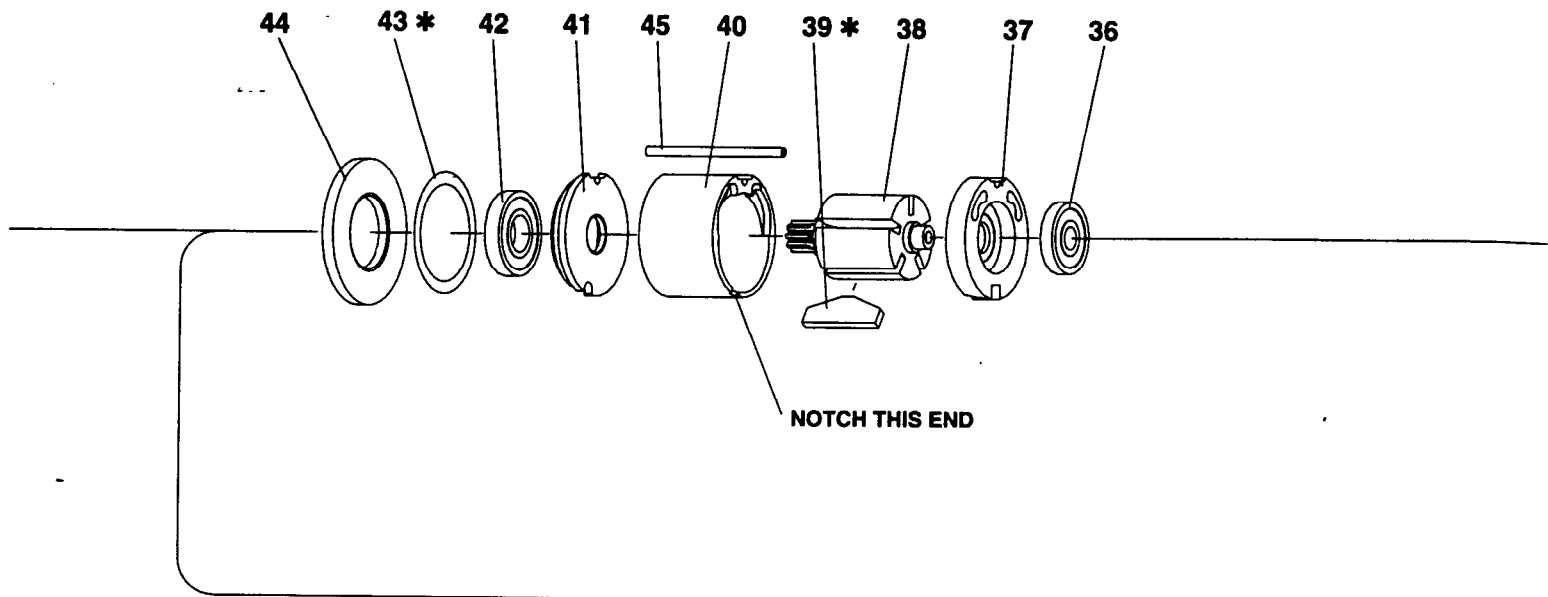
15.09:1 RED.

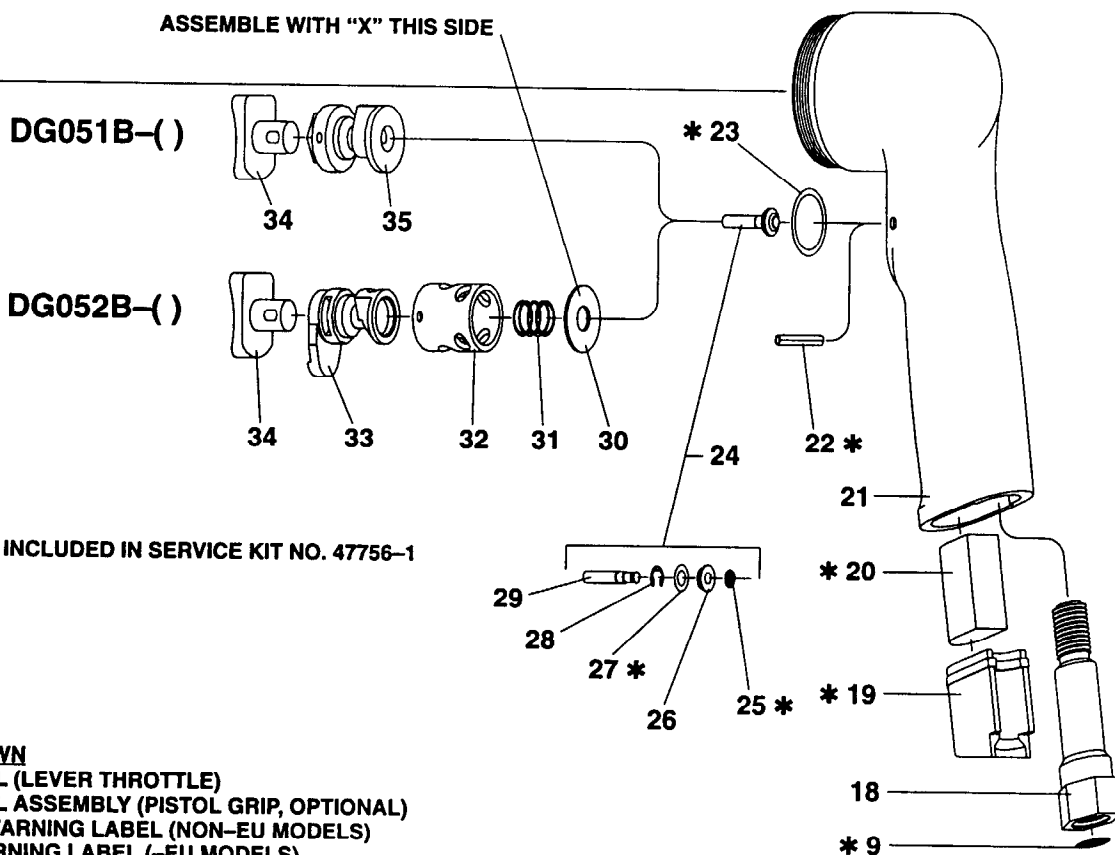
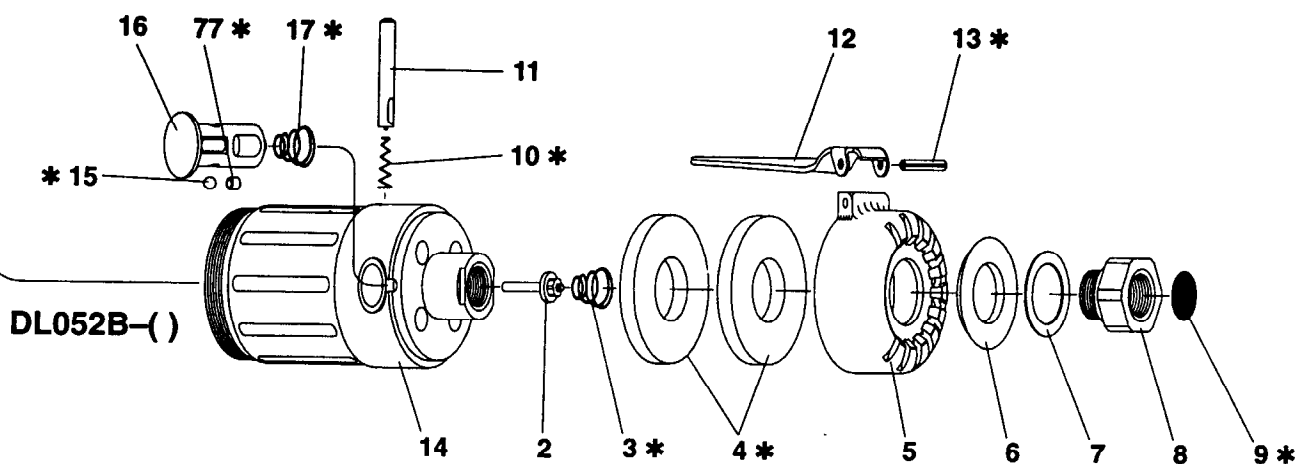
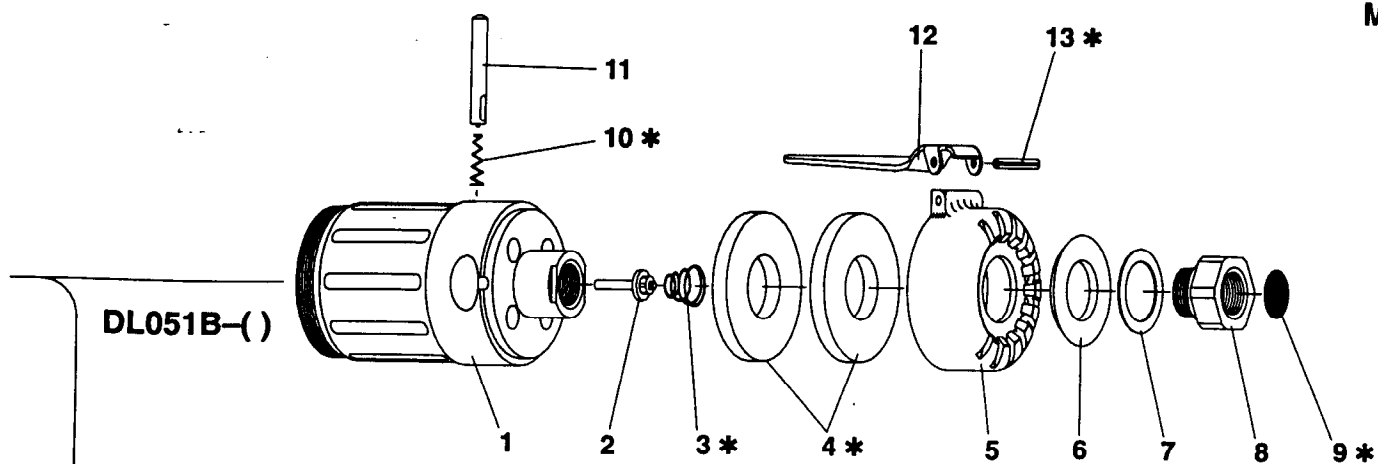


29.35:1 RED.



44.48:1 RED.





* ITEMS INCLUDED IN SERVICE KIT NO. 47756-1

NOT SHOWN

46328 BAIL (LEVER THROTTLE)
46472 BAIL ASSEMBLY (PISTOL GRIP, OPTIONAL)
48176-1 WARNING LABEL (NON-EU MODELS)
49883 WARNING LABEL (-EU MODELS)

DISASSEMBLY/ASSEMBLY INSTRUCTIONS

NOTICE

- Never apply excessive pressure by a holding device which may cause distortion of a part.
- Apply pressure evenly to parts which have a press fit.
- Apply even pressure to the bearing race that will be press fitted to the mating part.
- Use correct tools and fixtures when servicing this tool.
- Don't damage "O" rings when servicing this tool.
- Use only genuine ARO replacement parts for this tool. When ordering, specify part number, description, tool model number and serial number.

GEARING DISASSEMBLY

- Clamp tool in a smooth face vise – pistol grip models, clamp on handle (21) – straight models, clamp on inlet adapter (8).
- Remove drive option from tool (chuck, square drive, etc.).
- Unthread and remove ring gear (48, 59 or 63) and components using a wrench on flats of ring gear.
- Remove spindle(s) and gears from ring gear. NOTE: Keep gears grouped with mating spindle when disassembling double reduction gearing.
- Remove lock nut (53), releasing washer (52), bearings (50) and spacers (49 and 51).
- Do not remove gears (55 or 64) from carrier assembly unless damage is evident. Gears are press fit onto carrier assemblies.

GEARING ASSEMBLY

- Assemble spacer (49) and one bearing (50) into ring gear (48, 59 or 63), pressing on outer race of bearing.
- Coat shafts of spindle(s) with ARO 33153 grease.
- Assemble gears, containing bearings (57), to shafts of mating spindle.
- Assemble carrier assembly to spindle assembly of double reduction gearing.
- Lubricate sets of gears liberally with ARO 33153 grease (see "Routine Lubrication Requirements", page 3).
- Assemble spindle(s) and gearing into ring gear. Rotate spindle and gears to align gear teeth with splines of ring gear.
- Assemble spacer (51) and bearing (50) into ring gear, pressing on inner race of bearing.
- Assemble washer (52) to ring gear, securing with lock nut (53).
- Assemble ring gear and components to tool and tighten, using a wrench on flats of ring gear.
- Assemble spacer (54) and drive option to tool.

MOTOR DISASSEMBLY

- Remove gearing from tool.
- Remove spacer (44) and "O" ring (43).
- Tap front edge of housing to remove motor assembly. Locating pin (45) should also come out.
- Grasp cylinder in one hand and tap drive end of rotor (38) with a soft face hammer; motor will come apart. NOTE: Bearings are light press fit on rotor.
- Remove end plate (37) and bearing (36) from rotor.

MOTOR ASSEMBLY

- Lubricate bearing (36) with ARO 33153 grease and assemble into end plate (37), pressing on outer race of bearing.
- Assemble end plate (37) to rotor, pressing on inner race of bearing.
- Coat five rotor blades (39) with ARO 29665 spindle oil and assemble to rotor slots – straight side out.
- Coat i.d. of cylinder (40) with ARO 29665 spindle oil and assemble over rotor. NOTE: Air inlet slots in end of cylinder must be aligned with two air inlet holes in end plate (37).

- Assemble bearing (42) into end plate (41), pressing on outer race of bearing.
- Assemble end plate (41) to rotor, pressing on inner race of bearing. Be sure rotor turns without binding.
- Insert locating pin (45) into .096" diameter blind hole at bottom of motor cavity in housing.
- Align notches of end plates and cylinder and install motor into housing, aligning notches with locating pin (45).
- Grease and assemble "O" ring (43) to end plate (41).
- Assemble spacer (44) to motor.
- Assemble gearing to tool.

PISTOL GRIP HOUSING DISASSEMBLY

- Remove spiro pin (22), driving it out the left side of housing.
- Single Direction models: Remove trigger (34), plug (35), valve assembly (24) and "O" ring (23).
- Reversible models: Remove trigger (34), reverse valve (33), valve bushing (32), spring (31), washer (30), valve assembly (24) and "O" ring (23).
- Remove "O" ring (25), valve (26), "O" ring (27) and retaining ring (28).
- Remove inlet adapter (18), releasing muffler (19) and filler(s) (20).
- Remove screen (9) from inlet adapter (18).

PISTOL GRIP HOUSING ASSEMBLY

- Grease "O" ring (23) and assemble into housing (21).
- Assemble retaining ring (28) to valve stem (29).
- Grease "O" ring (27) and assemble to valve (26).
- Assemble valve (26) to valve stem, with smallest diameter of valve going on valve stem first.
- Grease "O" ring (25) and assemble to valve stem, securing valve (26).
- Single Direction models: Assemble valve stem thru plug (35) and assemble plug into housing (21), aligning .102" diameter holes in housing and plug.
- Reversible models: Assemble washer (30) and spring (31) over valve stem. NOTE: Assemble washer with "X" facing "O" ring (23). Assemble reverse valve (33) to valve bushing (32). NOTE: Position .102" diameter hole thru bushing to align with slot thru side of reverse valve. Assemble valve stem and components thru reverse valve (33) and bushing (32) and assemble into housing, aligning .102" diameter holes in housing and bushing.
- Assemble trigger (34), securing with pin (22). NOTE: Assemble pin from left side of housing.
- Assemble filler(s) (20) and muffler (19) to housing, securing with inlet adapter (18).
- Clean and replace screen (9) in inlet adapter.

LEVER THROTTLE HOUSING DISASSEMBLY

- Clamp inlet adapter (8) in a smooth face vise.
- Unthread housing (1 or 14), using a strap type wrench.
- Remove spacer (7), diffuser washer (6), exhaust cap (5), fillers (4), spring (3) and valve rod (2). NOTICE: Do not remove or adjust rubber portion of valve rod (2), as it is preset at the factory. However, if air leakage occurs due to wear, unscrew rubber portion of valve rod NOT more than one complete turn (counterclockwise).
- Reversible models: Remove pin (77), ball (15), valve body (16) and spring (17).
- Remove throttle pin (11) and spring (10).
- Remove screen (9) from inlet adapter (8).

LEVER THROTTLE HOUSING ASSEMBLY

- Assemble spring (10) and throttle pin (11) into housing, aligning slot in throttle pin with air inlet holes in housing.

DISASSEMBLY/ASSEMBLY INSTRUCTIONS

M20

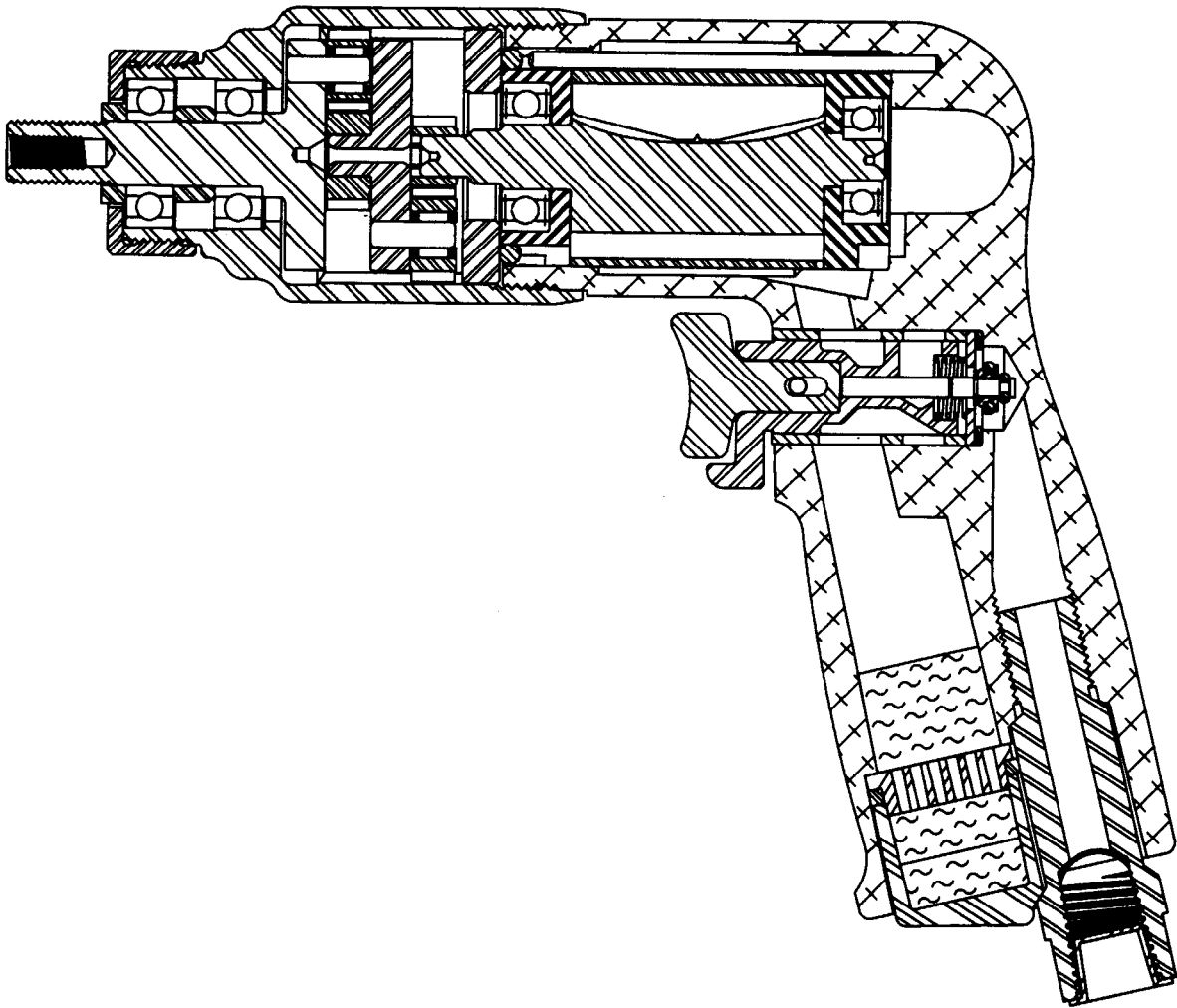
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- Reversible models: Assemble spring (17) and valve body (16) into housing, aligning ball slot in valve body with slot in housing.
- Assemble valve rod (2) into housing. NOTE: Throttle pin (11) should not pull out when valve rod is seated properly.
- Assemble two fillers (4) to exhaust cap (5).
- Reversible models: Assemble ball (15) and pin (77) into slots of housing and valve body (16).
- Assemble exhaust cap (5) to housing, aligning lever (12) with throttle pin (11).
- Assemble spring (3), diffuser washer (6) and spacer (7) to tool, securing with inlet adapter (8).
- Clean and replace screen (9) in inlet adapter.

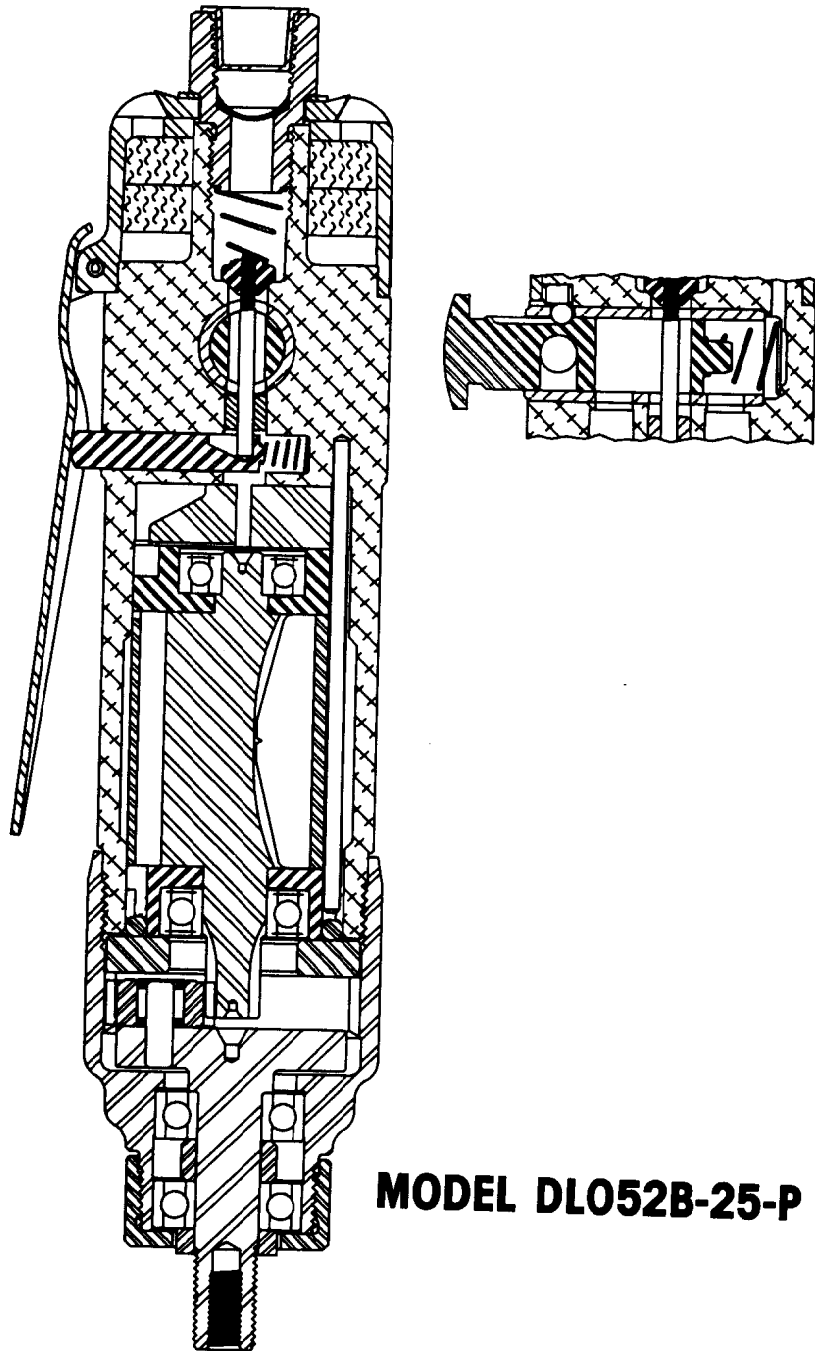
PART NUMBER FOR ORDERING

PART NUMBER FOR ORDERING

1	Housing	46723	45	Locating Pin	
2	Valve Rod Assembly	46354		for lever throttle models	47723-2
3	Spring	41654		for pistol grip models	47723-1
4	Filler (2 req'd)	46452	46	Drive Plate	46716
5	Exhaust Cap	46448	47	Spindle Assembly	
6	Diffuser Washer	46449		for single direction models	47805-5
7	Spacer	47205		for reversible models	47807-5
8	Inlet Adapter	46377	48	Ring Gear (single reduction, 51 teeth)	46713
9	Screen	33911	49	Spacer	46496
10	Spring	46374	50	Ball Bearing (2 req'd)	Y65-13
11	Throttle Pin	46296-2	51	Spacer	46706
12	Lever	46326	52	Washer	47682
13	Roll Pin	Y178-28	53	Lock Nut	46704
14	Housing	46486	54	Spacer	46705
15	Ball	Y16-204	55	Sun Gear (1 or 2 req'd) 3.43:1 ratio (21 teeth)	46465
16	Valve Body	46476	56	Planet Gear (3 or 6 req'd) 3.43:1 ratio (15 teeth)	46899
17	Spring	41654	57	Needle Bearing (3 or 6 req'd)	42315
18	Inlet Adapter	46385	58	Spindle Assembly	
19	Muffler Assembly	46857		for single direction models	47805-3
20	Filler (model DG051B requires 2)	46851		for reversible models	47807-3
21	Pistol Grip Housing	47367	59	Ring Gear (single reduction, 39 teeth)	46714
22	Spirol Pin	46849	60	Planet Gear (3 or 6 req'd) 6.67:1 ratio (21 teeth)	46901
23	"O" Ring	Y325-15	61	Spindle Assembly	
24	Valve Stem Assembly	46848-2		for single direction models	47805-1
25	"O" Ring	Y325-3		for reversible models	47807-1
26	Valve	45473	62	Carrier Assembly	46521
27	"O" Ring	Y325-7	63	Ring Gear (double reduction)	46712
28	Retaining Ring	Y180-13	64	Sun Gear 4.4:1 ratio (15 teeth)	46466
29	Valve Stem	46847-2	65	Planet Gear (3 req'd) 4.4:1 ratio (18 teeth)	46900
30	Washer	46379-1	66	Carrier Assembly	46522
31	Spring	41100	67	Carrier Assembly	46721
32	Valve Bushing	46381	68	Spindle Assembly	
33	Reverse Valve	46299		for single direction models	47805-2
34	Trigger	46298		for reversible models	47807-2
35	Plug	46406	69	Carrier Assembly	47544
36	Ball Bearing	47724	70	Chuck	
37	Rear End Plate	46312-1		0" - 1/4" capacity	47340
38	Rotor (see chart, page 4)			1/16" - 3/8" capacity	47341
	hex drive	46454		0" - 1/4" capacity	48459-1
	spline drive	46470	71	Screw	47060
39	Blade (5 req'd)	46413	72	3/8" Square Drive Adapter	30384-5
40	Cylinder		73	Roll Pin	Y178-39
	for single direction models	48201-1	74	1/2" Square Drive Adapter	30384-9
	for reversible models	46311	75	1/4" Hex Ball Lock Adapter	30712
41	Front End Plate	47722	76	Roll Pin	Y178-41
42	Ball Bearing	Y65-13	77	Pin	49983
	MOTOR ASSEMBLY (includes items 36 thru 42)(see chart, page 4)			SERVICE KIT: includes items 3, 4, 9, 10, 13, 15, 17, 19, 20, 22, 23, 25, 27, 39, 43, 52 and 77	47756-1
43	"O" Ring	Y325-214			
44	Spacer	46412			



MODEL DGO52B-10-P



MODEL DL052B-25-P



Part of worldwide Ingersoll-Rand

PN 49999-042